U.S. NUCLEAR REGULATORY COMMISSION

June 1975

REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

REGULATORY GUIDE 7.4

LEAKAGE TESTS ON PACKAGES FOR SHIPMENT OF RADIOACTIVE MATERIALS

A. INTRODUCTION

The Commission's regulation, 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions," applies to licensees of the Commission who transport licensed material or who deliver licensed material to a carrier for transport. Certain standards and requirements in 10 CFR Part 71 prescribe that there will be no release, or limited release, of radioactive materials from a package or component of a package under certain conditions. Section 71.35, "Standards for Normal Conditions of Transport for a Single Package," for example, requires that there be no release of radioactive material from the package containment vessel under the specified normal conditions of transport. Section 71.53, "Preliminary Determinations," as another example, requires that the package containment vessel not leak at an internal pressure 50 percent higher than the maximum normal operating pressure. This regulatory guide identifies a leak test standard acceptable to the NRC staff for use in demonstrating that packages of radioactive material comply with these containment requirements.

B. DISCUSSION

Subcommittee N14.5, Leakage Tests on Packages for Shipment of Radioactive Materials, of the American National Standards Institute (ANSI) has prepared a standard (ANSI N14.5[1]) that specifies:

1. Minimum leakage test requirements for package containment systems;

2. Methods for relating leakage test procedures to package containment requirements; and

3. Minimum requirements for leakage test procedures.

ANSI N14.5 is related directly to the package containment requirements of the International Atomic Energy Agency, Safety Series, No. 6. 1973 Edition. The IAEA requirements specify containment in terms of maximum leakage of radioactive material per unit time. ANSI N14.5 describes methods for converting those containment requirements to maximum permissible leakage rates for the tracer fluid, usually a gas, of a leakage test procedure. While 10 CFR Part 71 does not generally specify containment in terms of permissible leakage rates, it is recognized that no system provides absolute containment. ANSI N14.5 was issued in December 1974 for trial use and comment.

C. REGULATORY POSITION

The guidance contained in ANSI N14.5, "Leakage Tests on Packages for Shipment of Radioactive Materials," constitutes a procedure generally acceptable to the NRC staff for assessing the containment properties of a radioactive material package to satisfy the provisions of 10 CFR Part 71.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the staff's plans for utilizing this regulatory guide.

Effective on publication of this guide, the method described herein will be considered acceptable by the Commission's staff in assessing licensees' performance with respect to demonstrating that packages or their components do not leak. Alternative methods that satisfy the requirements in the Commission's regulations will also be considered acceptable.

[1] Copies of ANSI N14.5, "Leakage Tests on Packages for Shipment of Radioactive Materials," may be obtained from the Sales Department, American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.